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Throwing out the sulphur, water and ash, and counting the ignitable constituents only, these coals show the following proportions :

	Coal No. 3.	Coal No. 4.
Fixed Carbon.....	71.646	71.646
Volatile Hydrocarbons.....	28.354	28.354
	100.000	100.000

And the proportions of Volatile Matter and Fixed Carbon, are for No. 3, as 1 to 2.527 ; and for No. 4, as 1 to 2.527.

There are several points touching these coals which are noteworthy :

1. They range in proportion of Volatile Matters to Fixed Carbon from bituminous to semi-bituminous coals ; these proportions being 1 to 4.022 ; 1 to 4.132 ; 1 to 2.527 ; 1 to 2.527.
2. They carry an unusual percentage of water ; these percentages being 4.310 ; 5.815 ; 7.930 ; 6.830.
3. The gases driven off burn with a non-luminous flame.
4. None of the coals coke.
5. All of the four coals re-absorb in a short time fully 60 % of the water which has been expelled by raising their temperature to 225° F., in this respect differing from all the other Pennsylvania coals hitherto examined.

Notes upon the Collection of Coins and Medals now upon Exhibition at the Pennsylvania Museum and School of Industrial Art, Memorial Hall, Fairmount Park, Philadelphia.

BY HENRY PHILLIPS, JR., A. M.

(Read before the American Philosophical Society, Feb. 7, 1879.)

“Quem non moveat clarissimis monumentis testata consignataque vetustas?”

SPANHEIM.

The object of this display is to present Art as typified upon coins and medals, from the earliest known period until the present time, so as to show the student the nature and character of the development of æsthetic culture as exhibited by the aid of Numismatic science.

The change and advance presented by the inspection of coins and medals is a vast chain of ever closely joining links. From the very beginning of coinage, from the rudest of all ancient coins, the Persian daric or the tortoise of Ægina, to the majestic medallions of Syracuse, step by step every inch of the onward march of Art may readily be traced. The earliest of all known coins exhibit on the reverse only a shapeless punch mark, are the work of unskilled hands, are defective in type, in shape, in inscription, while the latest (or most modern), present complicated and intricate devices of all kinds and natures.

The present exhibition is composed of the collections of coins and medals belonging respectively to the Library Company of Philadelphia, the American Philosophical Society, and the Numismatic and Antiquarian Society of Philadelphia, under the care of which latter Society the collections have been deposited and arranged by a Committee, of which I am the Chairman. A few private individuals have also contributed to the exhibition.

The display may be divided into three great heads, viz: Coins, medals and tokens (embracing jettons), to the main features of which I shall briefly advert, beginning for convenience sake with the second general subdivision.

The case containing the medals of the Societies is a flat one of five trays on the western wall of the main hall of the building to the right of the entrance of the India room. They are of gold, silver, copper, bronze, brass and lead. The first series to be noticed is one consisting of thirty-one bronze medals of large sizes, commemorating victories and notable events in the history of the empire of Russia, from the time of Peter the Great to that of Catharine the second. They are all of very high relief, and bear for the most part on their obverse the nude bust of that Empress, exhibiting her as a young woman, and as time passes on showing the alterations it has caused in her appearance.

There are silver medals given by Kings George First and Second to the North American Indians, usually worn by the sachems as gorgets, and interred with them at their decease.

The one which bears the head of King George the Second is stated, in Vaux's life of Anthony Benezet, to have been cut in America, and is especially worthy of notice on that account, as having been the first medal ever made in this country. It is cut in very bold style, although the reverse is decidedly stiff of execution. The obverse bears the bust of King George the Second, with his titles, the reverse a Quaker seated on the ground is receiving from (or handing to) an Indian the calumet of peace; around is the inscription, "Let us look to the most high who blessed our fathers with peace."

Another silver gorget bears on the obverse an antique view of the city of Montreal, on the reverse engraved the word "Mohigrans," and in script the name *Tangran*, being probably the appellation of the chieftain to whom it had been presented.

The Indian medal of George the First bears on the reverse an Indian, armed with a bow and arrow, taking aim at a stag.

A series of well executed medals represents scenes in the lives of Louis XV., Louis XVI., Marie Antoinette, Lord Howe, Lord Cornwallis, Suwar-row, and others. There are fine medals of Rousseau, Lafayette, Liebnitz, Gauss, Thiersch, R. M. Patterson, David Rittenhouse, Berzelius, Charles XII., of Sweden, Louis XVIII., Napoleon (commemorating the introduction of vaccination), Napoleon and Josephine (accolated), Marquis of Granby, Earl Kildare, one commemorating the millenial anniversary of the Kingdoms of Sweden and Norway, one of King Augustus of Poland, and other celebrated persons and events.

A series represents the "Medallic History of the American Revolution," on which appear Franklin and Washington with various symbolical reverses. There are medals of Pitt, of Penn, and quite a number of Washington, embracing the "Manly," the "Sansom," the "Eccleston," the "C. C. A. U. S.," "He is in glory," &c., &c., &c.; medals commemorative of the peace of 1814, and that of 1783; one given to Defleury upon the capture of Stony Point, a fine gilt medallion of the Earl of Essex, cut by the celebrated Simon, in the days of the Commonwealth.

There is an interesting series of medalets in copper ranging in date from 1584 to 1620, representing various occurrences in the wars between King Philip the Second of Spain, and the United Provinces. A quaint silver medalet of the Sixteenth Century has on the obverse, David playing upon the harp before Saul, and on the reverse, David slaying Goliath. A medal of Sir Humphrey Davy and one of Matthew Boulton are especially noticeable for the boldness and finish of their execution, as well as one cut by Key (the medallist of the United States Mint) for Columbia College, New York city, bearing on the obverse a magnificent female head with the inscription "Light, Liberty, Law." There is also a medal of Hon. Eli K. Price, President of the Numismatic and Antiquarian Society of Philadelphia, issued on January 1, 1879, in commemoration of the Twenty-first anniversary of the foundation of that Society (also cut by Mr. Key).

An especial attention should be given to a remarkably complete series of Papal medals, seven hundred and sixty-four in number, starting from Pope Martin V. (1415), and ending with Pius IX. These medals were deposited by Thomas Hockley, Esq., of Philadelphia, and are in a case by themselves in the main hall. They are of fine execution, and of great historic interest. Among them may be found two engraved by BENEVENUTO CELLINI, one of Clement VIII. (1523-1534), (No. 47), representing Joseph making himself known to his brethren (being in allusion to the Pope's fraternal feelings toward the Florentines, his compatriots, despite their slight gratitude towards him); another (No. 52), of Paul III. (1534-1549), exhibiting a bust of that Pope with Ganymede, and an eagle on the reverse.

Several of the medals refer to the opening and the closing of the *Porta Santa*.

Various medals refer to the wars waged against the Turks by the Spaniards and the Venetians. No. 96 represents the victory of Lepanto in 1571; No. 89 refers to the conspiracy and punishment of Cardinal Caraffa and his accomplices; No. 110 (Gregory XIII.), (1572-1575), commemorates the massacre of Saint Bartholomew; No. 130 the Reformation of the Calendar in 1582; No. 153 (Gregory XIV.), exhibits the Pope giving to his nephew Hercules Sfondrati the banner of the Holy Church, upon his departure to fight against the French Protestants in 1591; No. 181 (Gregory XV., 1621-1622), represents the canonization in 1622 of the Saints Ignatius Loyola, Francis Xavier, Philip de Neri, Isidora and Theresa; No. 243 (Innocent X.), the Holy Ghost, being in reference to the condemnation of the doctrines of the Jansenists; No. 294 (Alexander VII.), represents the Castle of St.

Angelo adorned with statues ; No. 313 (Clement X., 1670-1676), commemorates the victory of John Sobieski, King of Poland, over the Turks, and exhibits him offering to the Pope the flags captured from the conquered enemy ; No. 338 (Innocent XI., 1676-1689), the condemnation of Molinos ; No. 342 refers to the alliance against the Turks formed by Innocent XI., the Emperor Leopold, John III., King of Poland, and the Doge of Venice in 1684 ; No. 355 (Alexander VIII., 1689-1691), the capture of the Morea by the Venetians from the Turks (we may note that the Parthenon was destroyed by Venetian bombshells in this encounter after surviving the hand of time for centuries after centuries) ; No. 381 (Clement XI., 1700-1721), represents the mission of Cardinal de Tournon to China ; No. 390, the machine by which the obelisk of the Plaza del Monte Cettorio at Rome was elevated ; No. 440 the arch of Constantine at Rome ; No. 492 (Clement XIII.), the city and fortress of Civita Vecchia ; No. 559 (Pius VII., 1800-1823), the bringing back of the Laocóón from Paris to Rome ; No. 561, angel delivering St. Peter from prison ; No. 572, the introduction of vaccination into the States of the Church ; No. 577 (Leo XII., 1823-1829), Saint Peter announcing the opening of the Jubilee ; No. 679 (Pius IX.), Rome triumphant wrapped in the Pontifical flag ; No. 680, medal for those who exhibited their fidelity to the Pope ; No. 686, medal for the Pontifical volunteers ; No. 700 and No. 702 relate to the visitation of the cholera in 1854 ; No. 706, the opening of the railway from Rome to Frascati ; No. 728, Daniel in the lion's den, refers to the Piedmontese invasion of 1861 ; No. 744 and 745 commemorate the eighteen hundredth anniversary of the martyrdom of Saint Peter and Saint Paul ; No. 754, the Roman exposition of 1870 ; also, eight special medals of Pius IX., commemorating the ecumenical council, and the twenty-sixth and twenty-seventh years of the papacy ; in all seven hundred and sixty-four medals.

This magnificent series is replete with interest historical, architectural, artistic and numismatic. Many of the public works and buildings of Rome are figured both in their former and present conditions ; churches, basilicas, façades, palaces, aqueducts, armorial bearings, sepulchres, canonizations, victories, are all represented in this (very rarely) complete collection. The workmanship is of the highest order of merit, and the medals are in the finest possible condition. The example of Mr. Hockley is one worthy of imitation by our public spirited citizens, who in so many instances require but the knowledge of a need to be brought to their notice.

According to Henin, there are six grand chronological epochs of coinage, all of which may with great certainty be known from the indications afforded us by the metals, the legends, the form of letters, methods of fabrication and style of art.

First. From the first invention of coinage to the time of Alexander the First, King of Macedonia, *i. e.* from about the seventh century B. C. to the year 454 B. C. This was the rudest epoch of the art ; the metal was mainly silver, some little gold, and no copper. The form of the coins was globular and irregular, bearing on the reverse the rude punch mark (*creux*

carre), and sometimes the incused figure of the obverse. The legends were of the simplest character, being only the names of cities or magistrates, sometimes from left to right, sometimes in the contrary direction, and sometimes returning in the manner known as *Boustrophodon*.

The artists who produced these coins did so without models or the accessories of a later age, and arrived, nature led, at a style both sublime and true. A remarkable difference exists between ancient and modern coins, the former being of extremely bold execution and high relief, while the latter are comparatively flat and low, the *haut relief* preserving the types of the coins longer after entering into circulation.

Second. From the death of Alexander the First to the time of Philip the Second, the father of Alexander the Great, B. C. 359.

It was during this period that the arts attained a very high perfection in Greece, and it has been believed that the fine engraving upon coins was executed by the hands of artists skilled in the working of precious stones. Copper coinage, but in small quantities, now began to be used as currency, being first struck (in Macedonia), by Amyntas Second (307 B. C.), and is referred to in a passage in "The Frogs" of Aristophanes as having been but lately introduced into Athens. Simplicity was still preserved in art, leading to the grandest results.

Third. From the accession of Philip the Second to the subversion of the Roman Empire by Augustus Caesar (B. C. 30).

Now the arts had reached their apogee, and coin after coin may be cited as *chef d'œuvres* of the skill of the ancients. The inscriptions became more complex, embracing titles of magistrates, divinities, dates, monograms and similar indications. Regularity and exactness are now more characteristic of the coinage, and the art of striking reached a greater degree of precision than ever before. The mechanical means employed were still simple, and remained so for many centuries; the remarkable results obtained from such slender appliances are the more noteworthy from that fact.

Fourth. From Augustus to Hadrian (A. D. 117). The decadence of art and the diminution of the importance and prerogatives of the Grecian nations began now more sensibly to make themselves perceptible. The moneys struck by independent cities lessened in number and excellence, and many nations lost their former right of coinage. Copper began to usurp the place of other metals, being issued in much larger quantities than formerly, and the art of coinage commenced to exhibit symptoms of decay, although faint suggestions of former grandeur occasionally occur.

Fifth. From Hadrian to Gallienus (A. D. 260). Great and rapid was the decline of art in this period, full of troubles of all kinds for the empire, surrounded by barbarians, and torn by intestine dissensions.

Sixth. From Gallienus to the fall of the Eastern Empire (1453). The arts fell completely into barbarism during this long interval. There is but little to attract in the coinage of either the Eastern or Western Empires, and much to repel. The coins became harsh and hard, and finally lost all traces of any pretensions to the name of art. The imperial Greek, the Colonial

and the Autonomous series had long disappeared, the only circulating medium was the Roman coinage, now became barbarous in the extreme, and small in number.*

The exhibition of coins is in a standing case near the centre of the main room. Naturally it starts with the earliest of all known coinage (about 700 B. C.), the *Persian Daric*, of which an example in silver is shown. It bears on the obverse a kneeling archer, while the reverse is simply the rude punch mark, such as is found only on the most ancient coinages. It is to these coins that allusion is made in the story told of Agesilaus having been overcome by thirty thousand archers, meaning that that amount of Persian daric had been expended to procure his defeat.

Two large silver coins of Athens (known as Tetradrachms from their size), one about 400 B. C., the other perhaps two hundred years later, exhibit the modification of type and change of workmanship. On the reverse, the rude archaic owl in bold relief with great staring eyes has given place to a less aggressive bird ; the simple inscription *AθH* has received in addition the names of the moneymen ; the diota and olive branch lend additional significance to the bird of wisdom. On the obverse, the thoroughly Egyptian type of face displayed on the helmeted head of Pallas has been metamorphosed into the now generally received conventional type of Greek art. In antiquity these coins were known as *maidens*, referring to the spinsterhood of the goddess represented upon them, and also as "owls," from the figure upon their reverse. In one of the Greek dramas a miser is spoken of as having myriads of owls roosting beneath his roof, meaning that he had large quantities of these coins concealed in his house.

A fine Cistophorus of Apamea presenting the sacred *cista* of Dionysos enveloped by serpents is worthy of particular notice. The cistophori are tetradrachms, which bear as their generic type a wreath and berries of ivy, surrounding a chest whence issue serpents, being in reference to those carried in procession by the Bacchantes in their orgies, especially in Asia Minor, where the snake was revered, and considered as an emblem and tutelary god.

All the cistophori which exist are tetradrachms of silver, uniform in weight and fineness, and were struck by some one of the following cities, viz: Apamea in Phrygia, Ephesus in Doria, Laodicea in Phrygia, Pergamos in Mysia, Sardes and Tralles in Ionia.

They were of such exceeding purity and fineness that the Romans would receive no other coins in payment of the tribute moneys exacted from the cities of Asia Minor ; for this purpose they were coined in great abundance, and in ancient days were very plentiful, although at the present time they have become of quite rare occurrence.

M. Acilius in his triumph from Corinth, bore in procession 288,000 cistophori, Cn. Manlius Vulso, 250,000 ; L. Amilius Regillus, after a victory over the Antioch fleet, 131,000 ; Scipio Asiatica, 331,070. It is probable that these pieces, upon their arrival at Rome, by reason of their superior fineness

* Henin, *Numismatique Ancienne, passim.*

and quality, were at once recoined ; a fact which would account for their present scarcity*

Cista mystica existed in the sacred rites of the Panathenæa, of Diana, Eleusinia, Ceres, Theogamia Proserpine, and the Dionysia or orgies of Bacchus.

Upon the tetradrachms of Eleusis, serpents were the symbols surrounding or issuing from the cista, either as representing divine attributes, or the fable of Erichthon. On others, surrounding the chest were various emblems, such as combs, the pudenda muliebre, food, drink or fruits, and it was looked upon as a heinous sacrilege to divulge the meaning of these recondite objects.

A type also exists in which Bacchus, in womanly garb, is figured seated upon the *cista mystica*, holding in his right hand a thyrsus, below which are two serpents knotted and twined together. Chests, whence serpents are out-issuing, are found on the coins of Anchialis in Thrace, Sardis Nikaea, Pergamos, Perinthos and Teos.

A quinarius of Augustus Caesar exists, on which is engraved the *cista* between two serpents, and over which hovers a victory with the inscription **ASIA RECEPTA**.

A fine tetradrachm of Boeotia exhibits on the obverse the familiar Boeotian shield, and on the reverse, a cippus. The type of the buckler took its origin from the renown acquired by the workmen of this nation from their skill in this manufacture. In Homer we find mention made that the shield of Ajax was made at Hyle in Boeotia. Some authors have imagined it to be a perverted type of the Egyptian scarabæus, while the cippus represents the purifications and lustrations used in the worship of Bacchus. This latter opinion seems to be further borne out by the fact that the head of the Indian Bacchus is also frequently found upon the coins of this country.

A didrachm (*i. e.* a piece of two drachmas) of Tarentum, exhibits Taras, the fabled founder of the city (a son of Neptune), riding upon a dolphin. The coinage of Tarentum is numerous, presenting many different types, is always well executed, and exhibits a high degree of culture and art.

A didrachm of Argos shows on the obverse a running wolf, while the reverse has solely the letter "A" within the rude punch mark characteristic of the ancient period of its coinage.

On Messana we find the type to be a running hare, on the reverse a figure in a chariot, of which the execution while bold is rather rude. Messana is fabled to have been founded about 1600 B. C. under the name of Zancle, an appellation which was changed about 594 B. C. Destroyed by the Carthaginians in 396 B. C., it was subsequently rebuilt, and in 282

*NOTE.—*Livius Dec. X. L. VII.*

Alex. Xan : *Panellus de Cistophorisi.* Lugdun, 1734.
Rasche Lexicon Rei Numarie.

B. C., after having been captured by the Mamertines it received the name of Mamertina.

Rhodus presents the radiated head of Apollo, and on the reverse a rose, being a so-called speaking type. Spanheim,* however, considers this flower not to be a rose, but the Punic apple (*Balaustus*), citing Isaac Vossius as his authority. This plant was used for dying vestments, and is still known to the modern Arabs. According to Theophrastus, its flower resembled that of the rose, and Clement, of Alexandria, states that in the Thesmophoric rites women were not allowed to make use of it.

Upon the coins of Massilia (now Marseilles), we find a walking lion of fine workmanship; on Syracuse, the head of Proserpine in an incuse surrounded by dolphins, on the reverse a figure in a chariot. In the coins and medallions of Syracuse, ancient art reached its highest pinnacle of perfection; they are beautiful of design, grand and graceful of execution, bold of relief.

There are coins of Alexander the Great of Macedon, and a fine Tetradrachm of his father, King Philip the Second, bears upon the obverse a powerful head of Zeus, on the reverse, a horseman wearing the hat peculiar to Macedonia, surrounded by the inscription *ΦΙΛΙΠΠΟΥ*. The celebrity of the Macedonian and Thracian horse probably led to its adoption as a national type.

An extremely rare and fine silver coin of Juba the Second, King of Numidia, is noteworthy on account of its historical interest as well for its artistic merits. It bears on the obverse the head of that monarch with curly hair and a conical cap; on the reverse a temple.

A didrachm of Velia, in Lucania, presents a fine head of Apollo, and on the reverse a lion destroying a stag.

Tetradrachms of Antiochus, and one of Lysimachus, of magnificent workmanship and grand design, in the finest possible preservation, must especially claim the attention of the student as examples of Grecian art in its finest stage of development.

These coins are two thousand years old, and are almost as fresh as the day they left the die, while their entire genuineness and authenticity is beyond the faintest cavil or suspicion.

Space will not permit that we should enter into a full description of all the beautiful and artistic objects which this exhibition comprises, and we must content ourselves with a rapid survey of the most salient features of this display.

There are also a number of fine copies of rare Grecian coins, and an especially noticeable selection of forged Roman first bronzes, executed by the celebrated Paduaan forgers, Jean Cavino and Alessandro Bassiano, in the sixteenth century. The work of these artists has long been sought after on account of its exceeding great merits of design and execution, worthy to rank with the best workmen of antiquity. Many of these pieces are pure inventions of the forgers' brains, no originals ever having existed, while

* *De usu &c. numorum p. 374, et seq.*

others are well engraved counterfeits. These were originally sold only as copies of antiques, but their makers were subsequently induced to dispose of them as genuine.

The boldness of design and power displayed in the treatment of their subjects is of a very high degree of excellence.

The coinage of the ancient Greeks was very rarely (if ever) of a circular form, owing to the imperfection of the processes employed. They did not possess the knowledge of the collar by which in modern times accuracy in striking is ensured, and the result was in many instances that the coin contains only a portion of the device or inscription, the rest having failed to reach the planchet, as there was no means of holding it firmly in place to receive the stroke of the hammer.

The types that occur on the coinage of the ancients are manifold. The bull, the emblem of strength and force, is often found joined to a human head, as on the coins of Gelas, where it signifies human intellect and physical perfection. The bull occurs also in combat with the lion symbolizing the conflict of the fire element (or the sun), and that of water (*i. e.* the bull); this type is often found upon the Persian coinage. The serpent also frequently represents the ocean.

The earliest kings who placed their portraits upon coins, did so under the garb or disguise of gods and heroes; thus Alexander the Great appears as Herakles and Jupiter Ammon; Lysimachus, as the Horned Bacchus, and other examples will readily be found.

Their portraits, professedly as that of human beings, appeared on no coin till after the death of Alexander the Great, and even then the change took place with great caution and circumspection.

The leading characteristic of the coinage of the ancient Greeks, and as such it is to be found even upon their very earliest known specimens, is sublimity.* This arises from the simplicity of thought and object with which these early coins were designed and executed, and is the cause of the calmness and the repose of the Grecian art. Even the most archaic types possess this property, although in the transition stage from the rude to the excellent. Neatness and stiffness constitute archaism in art, and the condition of the early Greek mind has been compared by Humphreys very justly to the quaint productions of the masters of the fifteenth century.

Grecian art attained its highest perfection during the third period to which I have already alluded, viz: From the accession of Philip the Second of Maccedon to the final subversion of the Roman liberty under Augustus Cæsar. In the cities of Magna Grecia, it reached a most extraordinary degree of culture, regardless of their not far distant neighbor, the robber city, founded by outlaws, and living by rapine, that city, whose ambition still comprised within petty limits, had not yet broken its bounds to fly its conquering eagles above a prostrate world.

Rome now claims our attention. Its series is composed of gold, silver and bronze. The oldest silver pieces, denarii, are of the value of ten asses

* Humphreys.

(the letter X which so occurs upon them is the exponent of their value), and bear the galeated head of Minerva on one side, on the other the Dioscuri; sometimes on the reverse a biga or quadriga.

Later the names of illustrious families appear on them, whence these have often been termed family coins, as for example, the name of COCLES on those of the Horatian gens; sometimes emblems or types commemorating heroic exploits or punning upon their own names, as upon the coins of Publicius Malleolus we find a hammer, of Valerius Asciculus, a pickaxe; of Aquilius Florus, a flower; of Lucretius Trio, the seven stars (Septentriones), &c.

Upon certain of these coins we find deities appropriated, thus *Juno Sospita* on the families Cornuficia, Mettia, Pappia, Roscia; *Ceres* on Claudia and Vibia; *Libertas* crowned with laurel and veiled on Sestia; crowned with olive branches on Licinia; crowned with laurel on Junia; veiled on Æmilia and Calpurnia. Sometimes *Libertas* appears as a female standing, holding in her hand a liberty cap, in her left the ruditis, or rod, whose touch manumitted slaves. Upon the early copper coinage of the United States we find the head of liberty accompanied by the cap and rod, being in allusion to this Roman custom.

Among the family coins in the exhibition, there is one of the gens *Corneilia* bearing on the obverse an archaic head of Minerva galeated, and the inscription SULA; one of the gens *Hostilia*, obverse a diademed head of Venus, reverse, a victory walking, holding caduceus and palm branch, inscription SASERN. L. HOSTILIUS. Saserna was the cognomen of this noble family which deduced its descent from King Tullus Hostilius. Some of their denarii bear the head of Pallor or Pavor, to whom that monarch vowed a temple upon the occasion of his battle with the Veientes.

A denarius of Julius Cæsar bears an elephant trampling upon a snake which is rearing its head; reverse, the simpulum, adsperrillum, apex and securis victimaria, emblems of his pontificate. The elephant is said to refer to his victories over Juba, King of Numidia, and the subjugation of Africa of which it was the symbol. Other authorities consider it as a speaking type, asserting that the word Cæsar, in the Punic tongue, signified an elephant. One author has informed us that these sacred emblems (whose use and meaning is so well known to us) were nothing but the weapons with which the Romans were wont to fight against elephants in time of battle.

Upon a denarius of the gens Scribonia we find on the obverse a female head with the inscription LIBO. BON. EVENT.; reverse a puteal (or well stone) in the form of an altar with the inscription PUTEAL above, SCRIBONIA in the exergue. This is a very interesting coin referring to the puteal in the Comitium built on the spot where the events of the story of King Tarquin and the augur occurred, and where in later days the knife and the whetstone were found buried. Here were oaths taken as an especially sacred place.

Many such puteals abound in Pompeii, in the form of circular altars,

richly decorated with sculptures. The one which this coin presents has on each side a lyre suspended with a festoon in the middle and a hammer at bottom. It would seem that L. Scribonius Libo renewed this puteal, whence it obtained his name. It is twice referred to in Horace (*Epist. Lib. I. 19. 8.*, *Sat. Lib. II. 6. 34*).

In 1812 an altar was found at Veii, in every respect corresponding with this representation, and it is likely that the puteal Libonis served as a model for imitation in other places.

After the decline of Roman liberty the emperors coined gold and silver, but the bronze remained the prerogative of the Senate. Upon the reverse of the imperial denarii occur many interesting types such as Pax, Providentia, Pietas, Fecunditas, *Æquitas*, Concordia, Tranquillitas, Constantia, Pudicitia, Decursio, Adlocutio, Fides, Spes, Victoria, Fortuna, and a multitude of others. Upon the decease of an emperor, it was the custom to deify him, and to issue coins commemorating the event; they usually bear on the reverse the word *CONSECRATIO*, and an eagle soaring to heaven, or a chariot drawn by four elephants, or a Phoenix, the head on the obverse being surrounded by rays. When it was a female who received this honor, as in the case of one of the imperial family, the reverse bore a peacock, or a chariot drawn by peacocks, or a carpentum drawn by mules.

The servile adulation which had been their portion in life was not ended even in death.

The very earliest of the Roman coinage was of copper (or bronze), and was issued by Servius Tullius, about the sixth century before Christ. The *As* was the primitive monetary unit of Rome, and although from time to time reduced in weight retained its legal value always unchanged. The coinage of silver, the denarius, quinarius, and the sestertius began about 269 B. C.; gold was first minted about 206 B. C.

One coin alone has preserved to us the monetary implements of the ancients; a denarius of the gens Carisia bears on the reverse the pincers, hammer, anvil and bonnet of Vulcan.

When the first Triumvirs placed their own effigies upon the coins, they gave a great shock to the ancient habits and superstitions of the Roman people by displacing the old traditional types of gods and goddesses. Pompey and Cæsar were the first to set the example, which was followed by their relatives and their successors in authority, although by some authors it is held that the head of Pompey was not placed upon coins until after his death, and that it was then done by his sons.

Among the imperial Roman series are many fine and rare coins, starting from Julius Cæsar and coming well down to the later days of the Byzantine empire. There are pieces of Augustus, Agrippa, Mark Antony, Antoninus Pius, *Ælius Cæsar*, Caracalla and Geta, Domitian, Claudius, *Ca*ligula, Elagabalus, Gallienius, Herennius Etruscus, Hadrian, Julian the Second, Maximinius, Marcus Aurelius, Philippus, Pertinax, Titus, Trajan, Vespasianus, and many others. They all bear the image of the emperor on the obverse, and on the reverse in many instances commemorate important

events. They are in no way remarkable for the art displayed upon their coinage, and maintain their chief interest from their historical associations, while their claims to be regarded as exhibiting a graceful execution are very slight when we compare them with the *chef d'œuvres* of the Grecian artists. The arts never flourished in Rome as they did in Greece, they were never indigenous to the soil that bore a band of rugged heroes.

The coinage of the Roman nation, from its earliest inception down to the capture of Constantinople by the Turks, presents to us a lengthy and uninterrupted chain for two thousand years. Upon the series are preserved to us the portraits of the monarchs, their wives and families, relations and generals; it forms a connecting link between the misty, shadowy realm of the forever past, and the living, breathing, moving present of to-day.

Upon the coinage are found their wars and conquests and expeditions, imperial voyages to distant portions of the empire, valuable historical facts and epochs. We shall take occasion later to more fully advert to these interesting records.

Coins of the Sassanidæ, the rulers of the second Persian empire, from about 226 A. D. to 651 A. D. are curious and interesting. They are thin flat silver coins, bearing on the obverse a bust of the monarch wearing a peculiar head dress, on the reverse a fire altar stands between two figures dressed in the old Persian garb (representing respectively the genii of good and evil), and an inscription in Arian characters is at the side. These coins are of uncouth and barbarous design and workmanship, and represent a period of decadence in art before the Mohammedan conquest had prohibited the representation of the human figure as idolatrous.

The art of coinage, as carried into the East by Alexander the Great, remained in Bactria and India for many centuries, where money was long coined with inscriptions in the Greek languages, the coins of the Arsacidae in Armenia, and of the Sassanidæ in Persia, bringing the mintages of Central Asia down to a comparatively recent period.

We now come to the coinage of Great Britain, as being a good connecting link between the Roman and the modern eras of coinage. A very heavy and uncouth gold British coin of remote antiquity, perhaps of a period even before the days of Cæsar, marks the beginning. Then in regular order come the rude coinages of the various early monarchs (too familiar to require description here), pennies, groats, &c., &c., broad gold pieces of James I., Charles I., and the Commonwealth of England; a very fine crown of Queen Elizabeth; gold "touch pieces," given by Kings Charles the Second and James the Second, to those unfortunate beings whom, in conformity with the superstitions of the times, they "touched" to cure the King's evil; a fine Gothic pattern crown of Queen Victoria, but never adopted for the national coinage.

Coins of Philip and Mary, bearing both their heads. These were current until a comparatively recent date, and were referred to in Hudibras:

"* * * * * cooing and billing,
Like Philip and Mary upon a shilling."

Scotland is represented by coins of John Baliol and Alexander the Third, and a fine dollar, bearing the name of Queen Mary and her husband, the ill-fated Darnley. Upon the reverse of this coin is a yew tree, popularly supposed to be the one which grew in the court yard of Darnley's residence at Cruikston, from which circumstance this coin is known as the "Cruikston dollar."

There are also a number of coins of the English sovereigns struck for Scotland and Ireland, and various siege pieces of Charles the First, who never in all his extremities resorted to the expedient of a debased coinage.

Germany, rich in silver mines, exhibits a number of fine crowns of different emperors, dukes, bishops, &c., &c.; and a coin of Vladislaus of Poland (a noble kingdom, for centuries the bulwark of Christendom against the Turk, in the end despoiled and devoured by the very monarchies which its valor had preserved). These pieces range from 1586 to 1689. There are also many silver pieces of the various countries, comprising the Netherlands, such as Gueldres, Zeeland, Campen, &c., &c.

A full line of Spanish and Portuguese coins carries us from the sixteenth century to the present time, among which, is a silver dollar of Philip the Second of Spain, on which among his titles appears that of King of England.

France is represented from Henry the Fourth, including a number of silver ecus of various monarchs. On those of Louis the Fourteenth, we can trace the progress of his years, his coins exhibiting him in various stages from youth to old age. Louis XV. is shown as a very handsome young man. There are also coins of Louis XVI., Napoleon, Louis XVIII., Louis Phillippe, Charles X., the Republic of 1848, Napoleon Third, and the present Republic.

Russia shows specimens of the platinum coinage, which, after a short trial, was abandoned as an unsuccessful experiment, and which is very rare.

The coinage of the Orient is largely represented, including a full set of the rare and curious "bullet money," from Siam, formed by bringing together the ends of oval pieces of silver, and on each piece is stamped a minute mark showing its value. Each "bullet" is perfectly symmetrical and its weight is very accurately and carefully proportioned to that of the other pieces. They are eight in number, and are named Pie, Sungpee, Fung, Salung, Song Salung, Tical (or Bat) Songbat, Sibat.

There are some curiously stamped coins from Cochin China, long and narrow in shape.

Japan presents a full set of gold, silver and copper coinage, both ancient and modern, the liberal gift of Lieutenant Paul, U. S. N., to the Numismatic and Antiquarian Society of Philadelphia, upon his return from the Orient.

There are coins of the great Orkan, and also a complete series of thirty-three Ottoman monarchs, the successors of Mahomet, very rare but barbarous in art and uninteresting, save from historical association.

There are specimens of the coinage of the Caliphs of Bagdad, and of the Moorish rulers of Spain.

There are also some of the "chopped" money, current in China, where the custom exists of mercantile houses placing their "chop" (or guarantee firm name) upon all the silver money that passes through their hands. The effect of this is very soon to render a coin utterly unrecognizable through the multiplicity of "chops" that it had received.

Scandinavia presents nothing remarkable, except the copper *dalers*, issued in the reign of Charles XII., when his insatiate thirst for glory had almost reduced his kingdom to beggary. To obtain the necessary revenues for carrying on his mad career he issued small copper pieces which were to be a legal tender for a dollar. The experiment failed, after working the usual amount of hardships, and its originator, Baron Goertz, paid with his life the penalty of its ill-success.*

In America we find an uncirculated cent of 1793, a beautiful head with flowing hair, an object far more tasteful than the last design with which the authorities of the United States mint have favored us. The very rare silver piece coined by Louis XIV., for circulation in the Franco-American colonies, known as the *Gloriam regni*, exists here in fine condition, as also the Rosa Americana half penny, coined for circulation in British North America, in the reign of King George the First; Georgius Triumpho, Immunis Columbia, Bar Cent, Nova Constellatio, Talbot Allum and Lee (of New York) cent 1794, the Higley copper, coined in Connecticut in 1737, Nova Cæsarea, Vermont, Virginia, Nova Constellatio, Connecticut and Massachusetts coppers, Massachusetts shilling and three pence of 1652 (of which former coin it is narrated that the daughter of the mint master was given her weight as a dowry, she standing in one scale while the money was poured into the other), the sixpence issued in 1783, by I. Chalmers, a jeweller at Annapolis, a very fine Washington cent 1791, large eagle, a number of fine proof-sets and coins of the United States Mint, including the pattern dollar of 1836, the set of pattern cents of 1858, the pattern cents of 1850, 1855 and 1854, the set of pattern half dollars of 1868.

Among the patterns is a *goloid metric* dollar, a composition, the invention of William Wheeler Hubbell, Esq., which was proposed as being especially adapted for the coinage of the standard dollar. It contains gold, silver and copper in fixed proportions, but presents the feeling and appearance of a very light silver coin. Of these patterns there were not more than twenty-five struck and it is of the greatest rarity.

There is the general and customary assortment of the coins usually incident to the American series, a series which contains very little either of beauty or of interest, so that in the present instance where our aim was mainly to exhibit *Art* no attempt has been made towards a display of mere numismatic rarities.

*The names of this series are as follows:

Crown	1715.	Saturn . .	}	Flink och fardig	{ 1719.
Pallas	1716.	Jupiter . .		Hopel	
Publica fides	1717.	Mars . . .		1718.	
		Mercury..		Goertz's Head.	
		Phœbus ..			

The object in hand is to show Art in its origin, growth and progress ; Art as a hand-maid for the illustration of mythology and the elucidation of history ; Art as an interpreter of the classics, where many obscure passages find upon coins their only true solution. Treatise after treatise has been written to show the advantage to be derived from the study of ancient coinages. Agostino, Goltz, Strada, Eckhel, Spanheim, and a myriad of others have contributed their stores of knowledge to the general fund.

Coins throw light upon the history of nations, their forms of government, the political condition of their citizens ; they indicate the classification of their inhabitants ; they serve to fix the successions of monarchs, the events of their reigns, and the dates of eras. They have preserved to us the names of a multitude of civic magistrates and rulers, their offices and functions. They have presented to us the images of sovereigns and great personages of history, the heroes of antiquity, poets, painters, philosophers, and sages, gods, goddesses, demigods, legislators and women of fame. They have added largely to our geographical knowledge of the ancient world, exhibiting rivers and fountains, seas and mountains, rocks and other characteristics of places. Many cities have borne different names at various times and coins alone have authenticated their proper attribution. Coins bear frequently types which relate to the religions of the ancient world, both as representing persons, ideas, creeds, shrines, temples, altars and places of worship, sacrifices, utensils and sacred objects. The holy stone to whose worship Elagabalus was consecrated, Diana of the Ephesians, and many similar devices exist on coins.

Many customs are found on coins, such as *congiaries*, *games*, *allocutions*, &c., and ornaments and forms of dress are also thus preserved to our times.

Architecture has also been enriched by the edifices, bridges, arches, columns, monuments and similar objects which historians have not fully described, as being too familiar a subject or else have totally passed over, not being then in existence.

When we consider the vast extent of the riches and possessions of so many of the potentates and states of antiquity, the enormous quantity of ancient coins which have survived to our times should not surprise us. The antique earth was a world of commerce, as is our modern globe of to-day ; for the requirements of a commerce, which we know was an extensive one, large quantities of circulating medium were necessary, and the great mines of the archaic days furnished immense supplies of the precious metals. The Syracusans, the Athenians, Philip the Second of Macedon, Alexander Magnus, the Ptolemies of Egypt, and lastly the Romans, all issued great quantities of coined money during long centuries ; they were all wealthy and prosperous. In the Royal collection at Paris, probably the finest in the world, there are representative coins of sixty-five thousand different nations, cities and princes ; the whole number of coinage issued, it is supposed, would amount to about one hundred thousand.

The interest which attaches to the earliest day-dawn of civilization upon this planet, to human life in its first development in the far distant past, is

heightened by the perusal of these tokens which serve as a connecting link between those who live this day and have their being and those who lived three thousand years ago, who saw these works of art as they issued forth fresh from the coiner's hand ; who ate, who drank, who slept, who died while these coins were still in their first infancy. Strange customs and curious ethnological facts, traits and coincidences have been displayed or developed upon coins, the records of the earth verified and brought to light. The world's epitome is here ; history, geography, philosophy, religion, all bear their part.

Thrice happy he the gifted mortal who can lift the veil and read the secrets of the dusky night.

Stated Meeting, February 21, 1879.

Present, 8 members.

Vice-President, ELI K. PRICE, in the Chair.

Photographs for the album were received from Mr. John Ericsson, and Mr. William Ewing Dubois.

Letters of envoy were received from the Rev. F. C. Ager, Secretary A. Swedenborg Printing and Publishing House, New York ; from the Board of Commissioners of the Second Geological Survey of Pennsylvania, and from the Meteorological Office of the Royal Society, London.

Letters of acknowledgment were received from the Museum of Comp. Zoölogy, Cambridge, Massachusetts (102) ; the Historical Society of Pennsylvania (102) ; the American Chemical Society, No. 11 East Fourteenth Street, New York City (65 to 102 inclusive) ; from Mr. William Bower Taylor, 457 C. Street, Washington (102) ; Wisconsin State Historical Society, Madison (102) ; Royal Geological Society of Ireland (100 and List) ; West Chester Philosophical Society (65 to 102 inclusive) ; New Hampshire Historical Society (102) ; Poughkeepsie Society of Natural History (102) ; Rhode Island Historical Society (102) ; Numismatic and Antiquarian Society, Philadelphia (102) ; New Jersey Historical Society (102) ; Georgia Historical Society (102) ; Davenport Academy of Natural Science (101, 102), and from numerous